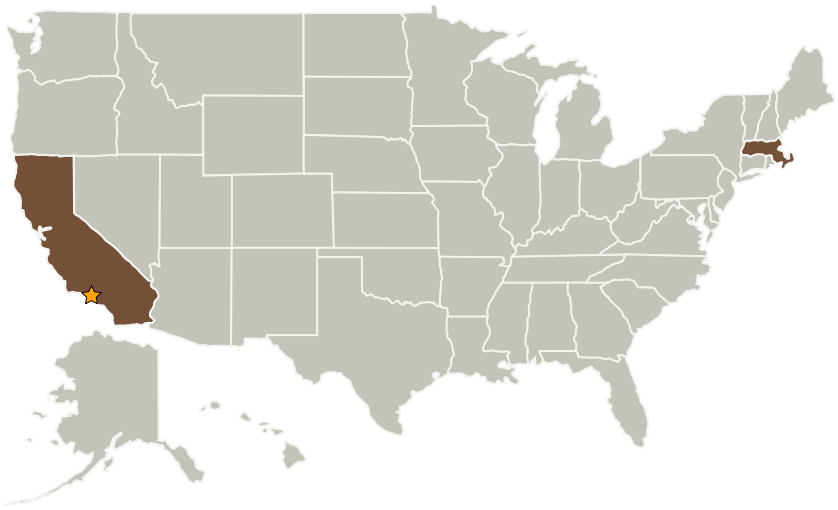
Control Valve for Miniature Xenon Ion Thruster, Phase II

Completed Technology Project (2007 - 2009)

Project Introduction

NASA is continuing its development of electric propulsion engines for various applications. Efforts have been directed toward both large and small thrusters, depending on the end use. A current program is focused on the development of a miniature thruster. Development of a Miniature Xenon Ion (MiXI) thruster will enable precision spacecraft positioning and formation maneuvers for formation-flying spacecraft. The current MiXI thruster prototype will provide 0.5 -- 3 mN thrust at 3000 sec specific impulse and efficiencies around 50% or better. The MiXI thruster will use Xenon propellant, a noble gas, minimizing spacecraft contamination.(http://dst.jpl.nasa.gov/thrusters/) One of the challenges of such a thruster is to be able to accurately control the flow of propellant. The required flow rates are on the order of 0.1 to 1.0 sccm of Xenon. To this end Midé, in Phase I, demonstrated that a small flow control valve, based on piezoelectric technology, met all performance objectives. Midé is a world leader in this technology, demonstrated by its existing patented packaged actuator product line and past valve experience. Aerojet provided electric propulsion expertise for the duration of the program and serve as a technology integration and transition path.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Mide Technology Corporation	Supporting Organization	Industry	Medford, Massachusetts

Primary U.S. Work Locations	
California	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.1 Integrated Systems and Ancillary Technologies